

Introduction

2013 showed that the Astbury Centre continues to be a thriving hub of scientific achievement, as this letter and the scientific reports that follow portray. I would like to take this opportunity to thank all Astbury members: the principal investigators, facility managers, technicians, students and postdocs for all of your efforts in generating this success. Without your enthusiasm, hard work, collegiality and excellent science that bring different disciplines together, this could not have happened. We also acknowledge, with thanks, the support of the University of Leeds; the Faculties of Biological Sciences and Maths and Physical Sciences and the Schools of Chemistry, Molecular and Cellular Biology and Physics and Astronomy for their support of the Centre. We are also much indebted to an array of funding agencies for supporting our science, including BBSRC, EPSRC, MRC, the Wellcome Trust, other charities, ERC, EU and Industry.

Our annual report provides summaries on-going scientific projects from the Astbury Centre's research outputs in 2013, chosen for highlight by the participating members. In its pages you will find new and exciting research which spans fundamental research in Structural Molecular Biology, Biophysics, Chemical Biology and Cell Biology, alongside the exploitation of the results obtained in biotechnology, bioengineering and medicine, each made possible by the inter- and multidisciplinary research within the Centre.

During 2013 the Centre continued in its quest of "Understanding Life in Molecular Detail" through multiple different activities, including seminars, publications, public lectures and other events. We continued to enjoy an excellent seminar series (organised by Arwen Pearson), hosting 11 lectures during 2013 with speakers from the UK, Germany, Belgium and the USA. The Centre also continued its "Research Theme" events for PIs, with topics this year including "Synthetic Biology", "Biomembrane and Membrane Proteins", "Antimicrobials and Astbury", and "Astbury Facilities". The Centre's Biennial Residential Research Retreat, held this year on September 19th/20th at the Shrigley Hall Hotel in Cheshire was a sell-out, with 149 attendees enjoying excellent seminars from students, post-docs and PIs. This year's retreat also included sessions highlighting new research equipment within the Centre and popular 'Flash Poster' presentations. We again welcomed representatives from the Wellcome Trust to the retreat, who led a session on "Careers and Fellowships" for the post-docs and students, whilst the PIs discussed "Opportunities for engagement with Industry" in a session led by Adam Nelson and Kate Langton from the University's Pharmaceutical and Biopharmaceutical Innovation Hub. A "Zombie Apocalypse", organised by the Astbury Society provided the stimulus for an amusing, challenging and excellent team-building event. Thank you to the Astbury Society for a memorable event!

The Centre welcomed five new academic staff members in 2013 (Andy Tuplin (RNA structure and virology), Anastasia Zhuravleva (Biological NMR of large complexes), Stephanie Wright (cancer biology and eukaryotic gene regulation), Jamel Mankouri (virus pathogenesis and ion channels) and Adrian Goldman (crystallography of membrane proteins)). We were sorry to lose Sarah Staniland and Peter Olmsted from the membership in 2013, as they took up academic positions elsewhere. We wish them well in their future careers. We were delighted to welcome many PhD students and postdocs to the Centre this year. This takes our current numbers to 65 academic staff, 144 PhD students, 77 postdoctoral researchers and 11 research fellows.

Astbury Centre members published their research in a wide range of journals in 2013, with a total of 123 manuscripts being published, including >10 papers in the high impact journals *Nature Communications*, *PNAS*, *Nature Chemistry*, *PLoS Biol* and *JACS*. In terms of grant income, Astbury members also enjoyed success in 2013. Highlights included the University's first ERC "Proof of Concept" Grant (€125k to Andy Wilson); a €2.5M ERC Advanced Grant (to Sheena Radford); a BBSRC Alert 13 grant to Adrian Goldman and Astbury colleagues for

new equipment for membrane protein crystallisation (~£1M investment); and the renewal (valued at ~£4.5M) of our Wellcome Trust funded 4 year PhD in “The Molecular Basis of Biological Mechanisms” led by Alan Berry. Together with >£11.6M new grant income raised for project and programme grants, this brings the Astbury portfolio to a £38M share of £60M of grants in 2013: an impressive figure that is testament to the hard work and success of our members.

2013 saw continuing success of the members of the Astbury Centre in terms of peer recognition. Our student and post-doc members again received several awards, including the Sir Howard Dalton Young Microbiologist of the Year award of the Society of General Microbiology to Sophie Schumann in Ade Whitehouse’s group. Our members were also winners of the BBSRC DTP business plan competition (Tony Palmer (Stephen Baldwin’s group) and Jess Haigh (Jim Deuchars’ group)); whilst prizes for poster presentations and oral presentations were awarded to Georgia Magnatti, Richard Doveston and Daniel Foley (Adam Nelson’s group); David Yeo (Andy Wilson’s group), James Ross (Bruce Turnbull and Emanuele Paci’s group) and Kayzaryna Makowska and Adriana Klyszejko (Michelle Peckham’s group). Congratulations also to our PI members who received honours: Lorna Dougan (the Royal Society of Chemistry’s (RSC) Macro Group UK Young Researcher’s Medal); Sheena Radford (the Carl Branden award of the Protein Society) and Bruce Turnbull (2013 Carbohydrate research Prize of the RSC). Others continued to play an active role in outreach activities: Tom Edwards was interviewed on Radio 4 with Eddie Mair and again with Melvyn Bragg in the aptly termed programme “Bragg on Braggs” to celebrate 100 years of crystallography; Bruce Turnbull and his group took part in the Royal Society’s Summer Science Exhibition; Peter Henderson’s work on “superbugs” was highlighted by the Yorkshire Evening Post; and Michelle Peckham took part in the Radio 4 programme “In our Time” on the topic “The Microscope”. Outreach is an important part of the Centre’s activities. Thank you to all who have participated in these events.

The Astbury Society, led by the presidents Sasha Derrington and Megan Hughes in 2013, alongside the current presidents Claire Windle and Katherine Horner, played a magnificent role in Astbury activities in 2013. The first May Ball was a spectacular hit and a highlight of the year. Other activities in 2013 involved the now-famous Christmas quiz night, a Film Night and the much-enjoyed cake bakes and coffee mornings. Together these events have raised more than £1,300 for the “Leeds Children’s Charity”. The Astbury Society also hosted the barbeque and Sports Day at the Seventh Annual Astbury Lecture which was given by Professor Frances Ashcroft, F Med Sci, FRS (University of Oxford) on “Metabolic Regulation of K-ATP Channels: From Molecules to Disease”. This annual event was its usual success, with a brilliant lecture, much fun and physical exertion at the sports day, and a much enjoyed barbeque. Photos of these events can be seen at www.astbury.leeds.ac.uk/about/society.php. Do take a look!

I hope that you enjoy reading this Annual Report whether you are a member of the Centre, a visitor, a member of our Industrial Advisory Board, a member of a funding agency that supports our activities or a passing reader with an interest in Structural Molecular Biology and the activities of our Centre. Finally, thank you to David Brockwell for editing this report, everyone who contributed to it, and all who participated in the Astbury Centre’s activities in 2013. I look forward to continuing our successes in 2014.

Sheena E. Radford

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Leeds, April 2014*

Please note that this report (as well as those from previous years) is also available as a PDF document which can be downloaded from our website (www.astbury.leeds.ac.uk).